REMARKS

Reconsideration and allowance of the subject application are respectively requested. By this Amendment, Applicants have amended claims 3, 7, 10, 13, 17, 20, and 23 and added new claims 30 and 31. Therefore, upon entry of this Amendment, claims 1-3, 5-13, 15-27, and 29-31 are all the claims pending in the application. In response to the Office Action, Applicants respectfully submit that the claims define patentable subject matter.

I. Information Disclosure Statement

Applicants thank the Examiner for considering the Information Disclosure Statements filed on June 8, 2006, September 14, 2006, August 2, 2006, and February 25, 2005. However, the Examiner states that Information Disclosure Statements filed on August 2, 2006 and February 25, 2005 fail to comply with 37 C.F.R. § 1.98(a)(3) for not including a concise explanation of the relevance of all of the documents.

A. Information Disclosure Statement on August 2, 2006

Reference JP 2003-345476 was cited in the Japanese Office Action of June 13, 2006 which was filed at the USPTO on August 2, 2006. Specifically, JP 2003-345476 is the Publication of Japanese patent application 2003-113499, both of which are cited in the Japanese Office Action. Accordingly, Applicants submit that the English language version of the Japanese Office Action satisfies the requirements under 37 C.F.R. § 1.98(a)(3) and respectfully request the Examiner to consider JP 2003-345476.

B. Information Disclosure Statement on February 25, 2005

The references JP 52-66937, JP 58-82478, JP 51-4714, JP 2000-512797, JP 63-202061, JP 2001-93551, JP 11-79703, JP 5-54900, JP 2000-317358, JP 2000-191304, 2002-93439, and JP 50-161024 were cited in related case Application No. 10/525,840 in an IDS filed on February 25, 2005. Application No. 10/525,840 has been published and is available for public viewing. Applicants direct the Examiner to the explanations given in Application No. 10/525,840 and submit that they satisfy the requirements of 37 C.F.R. § 1.98(a)(3) for the present application.

Also, for the Examiner's convenience, Applicants have attached a copy of the Information Disclosure Statement for Application No. 10/525,840 along with the international search report. Furthermore, JP 11-79703 is cited on page 3, lines 2-11 of Application No. 10/525,840. JP 5-54900 is cited on page 3, lines 12-18 of Application No. 10/525,840. JP 2000-317358 is cited on page 3, line 27 to page 4, line 7 of Application No. 10/525,840. JP 2000-191304 is cited on page 4, lines 8-16 of Application No. 10/525,840. JP 2002-93439 is cited on page 4, lines 17-24 of Application No. 10/525,840. Finally, Applicants have attached a short summary of JP 50-161024. Accordingly, Applicants respectfully request the Examiner to consider the above named references.

Also, reference JP 2002-56856 is described in the Specification of the present application at page 5, line 25 to page 6, line 5 which is also permitted by M.P.E.P. 609.04(a). Accordingly, Applicants respectfully request the Examiner to consider JP 2002-56856.

II. Claim Rejections Under 35 U.S.C. § 103

Claims 1, 3, 5, 6, 7, 11, 15-17, 26 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 2002-231290 to Hatanaka et al. (hereinafter Hatanaka) in view of JP 08-287941 to Takahashi (hereinafter Takahashi) and U.S. Patent No. 5,879,826 to Lehman et al. (hereinafter Lehman). Further, claims 3 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahashi and Lehman as applied to claims 1 and 11, and further in view of U.S. Patent No. 6,215,272 to Ohara et al. (hereinafter Ohara). Still further, claims 2 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahashi and Lehman as applied to claims 1 and 11 above and further in view of U.S. Patent No. 5,925,476 to Kawatsu (hereinafter Kawatsu). Claims 8, 9, 18, 19 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahasahi and Lehman as applied to claims 1, 11, and 26 above and further in view of U.S. Patent No. 6,117,579 to Gyoten et al. (hereinafter Gyoten). Claims 8, 9, 18 and 19 are also rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahashi and Lehman as applied to claims 1, 11 and 26 above and further in view of U.S. Patent No. 6,083,638 to Taniguchi et al. (hereinafter Taniguchi). Claims 10 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahashi and Lehman as applied to claims 1 and 11 above, and further in view of U.S. Patent No. 4,125,676 to Maricle et al. (hereinafter Maricle). Still further, claims 21 and 24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahashi and Lehman as applied to claim 11 above, and further in view of U.S. Patent Publication No. 2002/0187380 to Tanaka et al. (hereinafter Tanaka) and U.S. Patent No. 4,883,717 to Kitamura et al. (hereinafter Kitamura). Claims 22 and

23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahashi, Lehman, Tanaka, and Kitamura, as applied to claims 11 and 21 above, and further in view of U.S. Patent No. 5,642,413 to Little (hereinafter Little). Finally, claim 25 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka in view of Takahashi, Lehman, and Little. For the following reasons, Applicants respectfully traverse the Examiner's rejections.

A. Independent claims 1, 11, 25, and 26

Applicants respectfully traverse the rejections of independent claims 1, 11, 25, and 26 at least because there is no motivation to combine the cited art to provide for "said vibration generating unit [being] driven by a part of an output of said fuel cell main unit" or a "vibration [being] generated by using a part of output current of said fuel cell" as recited in claims 1, 11, 25, and 26 respectively.

The Examiner acknowledges that Hatanaka in view of Takahashi does not disclose or suggest the above recitations. The Examiner thus relies on Lehman to cure this conceded deficiency and alleges that Lehman discloses auxiliary devices (parasitic loads) of the fuel cell which are driven by the output of the fuel cell main unit for the benefit of supporting the functioning of the fuel cell. The Examiner also alleges that it would have been obvious to power the vibration generating unit of Hatanaka modified by Takahashi by an output of the fuel cell because Lehman teaches it is well recognized in the art that sub-systems that support the operation of the fuel cell can draw a parasitic load from the fuel cell.

However, in Lehman, the fuel cell using hydrogen gas and air gas is disclosed, in which carbon dioxide is not generated. With respect to this fuel cell, the supporting apparatuses are

disclosed such as pumps, compressors or blowers, control systems, and other equipment. These apparatuses are indispensable for continuous electric power generation in the fuel cell. That is, the fuel cell cannot generate electric power without these apparatuses.

On the other hand, in the present claimed invention, the fuel cell using liquid fuel and air gas is described, in which carbon dioxide is generated in the fuel electrode. Here, the fuel cell is premised on the continuous electric power generation in the fuel cell. The vibration generating unit is used for stabilizing and/or recovering the output in the long-term operation of the fuel cell. This means that the vibration generating unit is not "indispensable" for generating the electric power, but is effective for improving the performance. Accordingly, one skilled in the art would not have been motivated by the "indispensable" supporting apparatuses of Lehman to drive a non-indispensable apparatus such as a vibration generating unit by a part of an output of a fuel cell main unit.

For the above reasons, Applicants respectfully request the Examiner to withdraw the rejections of independent claims 1, 11, 25, and 26.

B. Dependent claims 2 and 12

In the previous Amendment, Applicants amended claims 2 and 12 to recite "a first voltmeter connected to a load, a second voltmeter connected to said fuel cell main unit, and an ammeter which measures the current from said fuel cell main unit to said load". In response to this amendment, the Examiner has withdrawn the previous rejections and now rejects claims 2 and 12 under 35 U.S.C. § 103(a) as being unpatentable Takahashi, Lehman, and newly cited Kawatsu.

The Examiner acknowledges that Kawatsu does not disclose a voltmeter connected to a load. The Examiner thus alleges that it would be obvious to apply a voltmeter to the load because the load would have an effect on the desired output voltage of the fuel cell. Applicants respectfully disagree.

Specifically, the Examiner does not say how a reading from a voltmeter that is connected to a load would be used. The Specification gives an example of how a voltmeter connected to a load may be used. In the Specification, the outputs from the voltmeter connected to the load and the voltmeter connected to the fuel cell main unit are compared in order to determine whether the fuel cell main unit needs to be vibrated. On the other hand, in Kawatsu, the output voltage from the fuel cell is compared with a threshold value. There is no disclosure in Kawatsu that connecting a voltmeter to a load is beneficial, much less what one skilled in the art should do with a reading from such a voltmeter. Accordingly, it would not have been obvious to fabricate a way to use a new measurement completely from scratch.

For the above reasons, Applicants respectfully request the Examiner to withdraw the rejections of dependent claims 2 and 12. Also, since claims 2 and 12 are dependent from claims 1 and 11 respectively, Applicants submit that claims 2 and 12 are allowable at least by virtue of their dependency.

C. Dependent claims 7 and 17

By this Amendment, Applicants have amended claims 7 and 17 to recite "wherein said fuel cell main unit further comprises a casing which surrounds said fuel electrode and said

oxidant electrode; wherein said casing of said fuel cell main unit is held on said holding substrate" to distinguish the casing of the fuel cell main unit from the substrate.[1] Applicants respectfully submit that the above element is not disclosed or suggested in the cited art.

Specifically, in Takahashi, the vibrating means 8 is only attached to the battery casing 1 and not a separate substrate. Accordingly, Takahashi does not disclose both a casing and a substrate, and Applicants respectfully request the Examiner to withdraw the rejections of claims 7 and 17. Also, since claims 7 and 17 are dependent on claim 1 and 11 respectively, Applicants submit that claims 7 and 17 are allowable at least by virtue of their dependency.

D. Dependent claims 8, 9, 18, and 19

In the previous Amendment, Applicants amended claims 8, 9, 18, and 19 to recite "wherein said fuel cell main unit includes a porous fuel electrode side current collector that is coated by hydrophilic(/hydrophobic) coating material." In response to this amendment, the Examiner has maintained the original rejection with optional support provided by newly cited Yamada. Additionally, the Examiner rejects claims 8, 9, 18, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Hatanaka, Takahashi, Lehman, and newly cited Taniguchi.

Original Rejection

As stated in the previous Amendment, Gyoten only discloses that the oxidant electrode side current collector has hydrophilic and hydrophobic regions and does not disclose that the fuel

[1] Support is found in the Specification at least at Fig. 3A.

electrode side current collector has the hydrophilic and hydrophobic regions.[2] Also, Gyoten provides the hydrophilic and hydrophobic regions to facilitate getting water out of the electrodes so that the reactant gasses can reach the electrodes.[3] Specifically, Gyoten discloses that water is created from a chemical reaction that occurs only in the oxidant electrode side current collector and that this water has a tendency to be stored in the oxidant electrode side current collector, which prevents oxygen from reaching the current collector.[4] However, Gyoten does not disclose water having a tendency to be stored in the fuel electrode side current collector. Therefore, one skilled in the art would not provide the hydrophilic and hydrophobic regions disclosed in Gyoten on the fuel electrode side current collector because there would be no water stored in the fuel electrode side current collector to facilitate out.

Rejection Citing Yamada

The Examiner seems to acknowledge that Gyoten by itself is deficient. The Examiner thus alleges that Yamada discloses that water can be formed on the fuel electrode side but does not cite to where in Yamada this disclosure is located. Also, Applicants have been unable to locate such a disclosure. Specifically, Yamada only discloses that the fuel supplied to the fuel electrode may be a mixture of methanol and water. However, the fuel electrode does not form water in a chemical reaction, but instead the fuel already contains water. Further, Yamada does

[2] Gyoten, col. 2, lines 41-48 and col. 2, line 56 to col. 3, line 6.

[3] Gyoten, col. 3, lines 1-3.

[4] *See* Gyoten, col. 1, lines 38-53 (explains how hydrogen is diffused from the fuel electrode side through the polymer electrolyte and then reacts with oxygen on the oxidant electrode side to produce water in the oxidant electrode side).

not disclose that there is any problem with the water preventing the methanol from reaching the fuel electrode or that the water is stored in the fuel electrode. Accordingly, Yamada does not disclose that the water that is pre-mixed with the methanol creates problems which are similar to the water stored in the oxidant electrode in Gyoten, and one skilled in the art would not have thought to use the hydrophilic and hydrophobic regions of Gyoten on the fuel electrode side current collector when a mixture of methanol and water is used as the fuel.

Further, even if water can be formed on the fuel electrode side in some fuel cells, one skilled in the art would not be motivated by Gyoten or Yamada to coat a hydrophilic/hydrophobic coating on the fuel electrode side current collector to obtain the claimed invention. Specifically, claims 8, 9, 18, and 19 are dependent from claims 1 and 11 respectively which recite that a "liquid fuel" is supplied. Neither Gyoten or Yamada disclose any problem regarding the storing of water when a liquid fuel is supplied, and therefore there is no motivation to combine.

Rejection Citing Taniguchi

Taniguchi discloses that both current collectors 200 and 210 are formed with hydrophobic layers 202 and hydrophilic layers 203 so that a reaction gas is supplied without obstacle and that a membrane is efficiently humidified. However, Taniguchi only discloses a gas fuel being used, and, as stated above, claims 1 and 11 require that an "liquid fuel" be supplied. Also, Taniguchi does not disclose that there is a problem with fuel being supplied or a membrane being efficiently humidified when a liquid fuel is supplied. Specifically, the Specification discloses that the stay of the gas bubbles is caused by the fact that the water covering the gas

bubbles is adhered and kept on the fuel electrode side current collector. However, Taniguchi does not disclose this or any other problem when a liquid fuel is supplied. Accordingly, there is no motivation to use the disclosure of Taniguchi when a liquid fuel is supplied.

For the above reasons, Applicants respectfully request the Examiner to withdraw the rejections of claims 8, 9, 18, and 19. Also, since claims 8, 9, 18, and 19 are dependent on claims 1 and 11 respectively, Applicants submit that claims 8, 9, 18, and 19 are allowable at least by virtue of their dependency.

E. Dependent claims 10 and 20

By this Amendment, Applicants have amended claims 10 and 20 to recite "wherein the diameter of said at least one hole gradually decreases as said at least one hole extends from said side of said fuel electrode catalyst layer to said opposite side"[5] and submit that the cited art does not disclose or suggest this recitation.

Specifically, Maricle only has a smaller pore layer 118 which is adjacent to a large pore layer 116. Accordingly, any hole which penetrates the layers only has roughly two diameters, a diameter corresponding to the large pore and a diameter corresponding to the small pore. Only having two diameters is not gradually decreasing the diameter, and Maricle does not disclose the above recitation.

Since the cited art does not disclose or suggest all the claim recitations, Applicants respectfully request the Examiner to withdraw the rejections of dependent claims 10 and 20.

[5] Support is found in the Specification at least at Fig. 5.

Also, since claims 10 and 20 are dependent on claims 1 and 11 respectively, Applicants submit that claims 10 and 20 are allowable at least by virtue of their dependency.

F. Dependent claim 22

Applicants respectfully traverse the rejection of dependent claim 22 at least because there is no motivation in Hatanaka in view of Takahashi, Lehman, Tanaka, Kitamura, and Little to provide "an information notifying unit which is arranged on said inner body, transmits said vibration to said outer body and notifies information to a user by vibrating said outer body based on said vibration" as recited in claim 22 (emphasis added).

The Examiner alleges that the vibrator 16 of Little is the information notifying unit. However, claim 11, from which claim 22 depends, recites that that the "vibration ... vibrate said fuel electrode". Accordingly, the vibration of claim 22 must vibrate both the outer body and the fuel electrode. However, there is no motivation in Little or any of the other cited references to have the vibrator 16 vibrate both the outer body and the fuel electrode. Specifically, Little only discloses vibrating the outer body and not a fuel cell. Furthermore, a telephone which uses a fuel cell that is vibrated could use a one vibrator to vibrate the outer body and another vibrator to vibrate the fuel cell. However, the cited art does not disclose doing either, and therefore does not disclose a motivation to have the vibrator 16 vibrate both the outer body and the fuel electrode.

Furthermore, the cited references teach away from having the vibrator 16 vibrate both the outer body and the fuel cell. For example, claim 21, from which claim 22 depends, further requires that "a vibration damping material ... connects said outer body and said inner body", and the Examiner acknowledges that this dampening material would decrease the amount of

vibrations that would be transmitted to the outer body. Accordingly, one skilled in the art would want to provide the vibrator that vibrates the outer body on a separate body so that the vibrations would not be reduced in order to effectively and efficiently notify the user.

Additionally, the vibration must notify information to a user. If the vibrator 16 was used to vibrate both the outer body and the fuel cell, then the vibrator 16 could be turned on only at specified times when the user is to be notified. Specifically, if the vibrator was turned on at any other time, then the user would be confused as to whether he or she was being notified of something or whether the fuel electrode just needed to be vibrated. On the other hand, only turning on the vibrator 16 at specified times would not adequately vibrate the fuel electrode to remove the carbon dioxide bubbles. Also, none of the cited references teaches a device which overcomes the above problems, such as the plunger 323 of Fig. 4 of the Specification. Accordingly, a person skilled in the art would not have been motivated to have the vibrator 16 vibrate both the fuel electrode and the outer body.

For the above reasons, Applicants respectfully request the Examiner to withdraw the rejection of dependent claim 22. Also, since claim 22 is dependent from claim 11, Applicants submit that claim 22 is allowable at least by virtue of its dependency to claim 11.

G. Dependent claim 23

Applicants respectfully traverse the rejection of dependent claim 23 at least because there is no motivation in Hatanaka in view of Takahashi, Lehman, Tanaka, Kitamura, and Little to provide "wherein said vibration generating unit is combined with an information notifying unit which transmits said vibration to said body and notifies information to a user by vibrating said

body based on said vibration" as recited in claim 23 (emphasis added). As shown in the discussion of claim 22, there is no motivation in Little or any of the other cited references to have the vibrator 16 of Little vibrate both the outer body and the fuel electrode. Also, the cited art teaches away from having the vibrator 16 of Little vibrate both the outer body and the fuel electrode because in this configuration the vibrator could be only turned on at specified times when the user is to be notified, as shown in the discussion of claim 22.

For the above reasons, Applicants respectfully request the Examiner to withdraw the rejection of dependent claim 23. Also, since claim 23 is dependent from claim 11, Applicants submit that claim 23 is allowable at least by virtue of its dependency to claim 11.

H. Dependent claims 3, 5, 6, 13, 15, 16, 21, 24, 27, and 29

Since claims 3, 5, 6, 13, 15, 16, 21, 24, 27, and 29 are dependent on claims 1, 11, and 26 respectively, Applicants submit that claims 3, 5, 6, 13, 15, 16, 21, 24, 27, and 29 are allowable at least by virtue of their dependency.

III. New Claims

By this Amendment, Applicants have added new claims 30 and 31 in order to claim additional aspects of the present invention that are not disclosed by the cited art.

Claims 30 and 31 are dependent on claims 22 and 23 respectively and recite "wherein said information unit can be in said second state when said vibration generating unit is generating said vibration."[6]

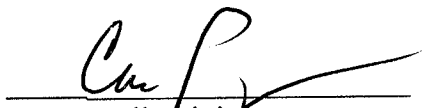
[6] Support is found in the Specification at least at Figs. 3A and 4.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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